## REMARKS

Claims 1-27 are presented for examination, of which Claims 1, 20, and 24 are in independent form. Claims 12 and 23-25 have been amended, with no change in scope, as to various matters of form.

An early and favorable examination on the merits is respectfully requested.

Applicant's undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

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IN THE CLAIMS:

The following is a complete listing of the claims, and replaces the original claims of the present application filed herewith.

Claim 1 (previously presented): An image processing device comprising:

an image pick-up device having the fixed positional relation with a measurement object;

an attitude sensor for measuring the attitude at an image pick-up visual point of said image pick-up device;

a storage unit adapted to store the calculation information to calculate the attitude and/or position of said measurement object on the basis of an output from said attitude sensor;

a target image setting unit adapted to set a target image that is an object for detecting a predetermined index on the basis of a picked-up image picked up by said image pick-up device;

a detecting unit adapted to detect the position of said index in said target image by performing a template matching process between a template image of said index and said target image;

an updating unit adapted to update said calculation information stored in said storage unit on the basis of a detected position of said index detected by said detecting unit; and

a calculation unit adapted to calculate the attitude and/or position of said measurement object on the basis of said measured value and said calculation information updated by said updating unit.

Claim 2 (previously presented): The image processing device according to claim 1, wherein said target image setting unit obtains a prediction position of the index in said picked-up image employing said measured value and said calculation information stored in said storage unit, creates an image with a peripheral area around said prediction position in said picked-up image subjected to a rotational process on the basis of a rotational angle in a roll direction of said image pick-up device derived from said measured value, and outputs said image as a target image.

Claim 3 (previously presented): The image processing device according to claim 2, wherein said calculation information is the correction information to correct for an error in the measured value of attitude measured by said attitude sensor, and said calculation unit calculates the attitude of said measurement object on the basis of said measured value and said correction information.

Claim 4 (previously presented): The image processing device according to claim 1, wherein said calculation information is the correction information to correct for an error in the measured value of attitude measured by said attitude sensor, and said calculation unit calculates the attitude of said measurement object on the basis of said measured value and said correction information.

Claim 5 (previously presented): The image processing device according to claim 1, wherein said calculation information is the correction information to correct for an error in the measured value of attitude measured by said attitude sensor and the position information of the image pick-up visual point of said image pickup device, and said calculation unit calculates the position and attitude of said measurement object on the basis of said measured value, said correction information and said position information.

Claim 6 (previously presented): The image processing device according to claim 1, wherein said calculation information is the position information of the image pick-up visual point of said image pickup device, and said calculation unit calculates the position and attitude of said measurement object on the basis of said measured value and said position information.

Claim 7 (previously presented): The image processing device according to claim 5, wherein said updating unit updates the position information in the two directions except for a depth direction in the camera coordinate system of said image pickup device, even when an index of only a single point is detected in said detecting unit.

Claim 8 (previously presented): The image processing device according to claim 3, wherein said correction information is the information to correct for an error in the azimuth direction among the measured values of the attitude measured by said attitude sensor.

Claim 9 (previously presented): The image processing device according to claim 1, wherein said updating unit updates said calculation information on the basis of the detected position of said index in said picked-up image.

Claim 10 (previously presented): The image processing device according to claim 3, wherein said updating unit updates said calculation information on the basis of a typical value of the updated value of said calculation information obtained for each index when a plurality of indices are detected in said detecting unit.

Claim 11 (previously presented): The image processing device according to claim 3, wherein said updating unit updates said calculation information on the basis of a dislocation between the prediction position and said detected position of said index in said target image.

Claim 12 (currently amended): The image processing device according to claim 11, wherein said updating unit updates said calculation information on the basis of a typical value of said dislocation obtained for each index when a plurality of indices are detected in said detecting [[means]] unit.

Claim 13 (previously presented): The image processing device according to claim 5, wherein said updating unit updates the position information in three directions in the camera coordinate system of said image pick-up device, when two or more indices are detected in said detecting unit.

Claim 14 (previously presented): The image processing device according to claim 1, wherein said index is a projected image of a landmark in the real space onto said picked-up image.

Claim 15 (previously presented): The image processing device according to claim 14, wherein the position of said landmark in the real space is known.

Claim 16 (previously presented): The image processing device according to claim 4, wherein said index is an image feature on said picked-up image.

Claim 17 (previously presented): The image processing device according to claim 1, wherein said measurement object is an image pick-up visual point of said image pick-up device.

Claim 18 (previously presented): The image processing device according to claim 17, further comprising display unit for displaying said picked-up image with the image in the virtual space superposed thereon on the basis of the attitude, or position and attitude of said image pick-up device calculated by said calculation unit.

Claim 19 (previously presented): The image processing device according to claim 1, wherein said measurement object is a visual point of the observer, and said image processing device further comprises display unit for displaying the image in the virtual space drawn on the basis of the attitude or position and attitude of the observer calculated

by said calculation unit on said display screen, while optically transmitting the image in the real space through said display screen observed by the observer.

Claim 20 (previously presented):  An image processing device in which the position of an index in a picked-up image picked up by an image pick-up device is detected by template matching employing a template image of said index, comprising:

an attitude sensor for measuring the attitude at an image pick-up visual point of said image pick-up device;

a target image creating unit adapted to create a target image having a peripheral area around a prediction position in said picked-up image subjected to a rotational process on the basis of the rotational angle in a roll direction from said measured values by obtaining said prediction position of the index in said picked-up image, employing the measured value of said attitude measured by said attitude sensor, and outputting the target image; and

a detecting unit adapted to detect the position of said index in said picked-up image by performing a template matching process between said template image and said target image.

Claim 21 (previously presented):  The image processing device according to claim 1, further comprising a template image creating unit adapted to create a template image for detecting said index from the image, wherein said template image creating unit specifies the position of the index in the picked-up image when said image pickup device is located at a predetermined position and attitude and creates a template image of the index

with a peripheral area around the position of the index in said picked-up image subjected to a rotational process on the basis of the rotational angle in a roll direction from said predetermined positional attitude.

Claim 22 (previously presented): The image processing device according to claim 1, wherein said attitude sensor measures the attitude of an image pick-up visual point of said image pick-up device in a state where there is an accumulated error in the measured value in the azimuth direction.

Claim 23 (currently amended): The image processing device according to claim 22, wherein said attitude sensor is constituted of comprises a gyro sensor.

Claim 24 (currently amended): An image processing method comprising:

an image pick-up step, of picking up an image with an image pick-up device having the fixed positional relation with a measurement object;

an attitude measuring step, of measuring the attitude at an image pick-up visual point of said the image pick-up device;

a storage step, of storing the calculation information to calculate the attitude and/or position of said the measurement object on the basis of the measured value measured [[at]] in said attitude measuring step;

a target image setting step, of setting a target image that is an object for detecting a predetermined index on the basis of said the picked-up image;

a detecting step, of detecting the position of ~~said~~ the index in ~~said~~ the target image by performing a template matching process between a template image of ~~said~~ the index and ~~said~~ the target image;

an updating step, of updating ~~said~~ the calculation information stored [[at]] in said storage step, on the basis of a detected position of ~~said~~ the index detected [[at]] in said detecting step; and

a calculating step, of calculating the attitude and/or position of ~~said~~ the measurement object on the basis of ~~said~~ the measured value and ~~said~~ the calculation information updated [[at]] in said updating step.


Claim 25 (currently amended): The image processing method according to claim 23, wherein said target image setting step comprises creating a target image with a peripheral area around a prediction position in said picked-up image subjected to a rotational process on the basis of the rotational angle in a roll direction of ~~said~~ the image pick-up device derived from ~~said~~ the measured value by obtaining ~~said~~ the prediction position of the index in ~~said~~ the picked-up image, employing the measured value and the calculation information stored [[at]] in said storage step.


Claim 26 (previously presented): A program code for executing the image processing method according to claim 24.


Claim 27 (previously presented): A storage medium storing the program code according to claim 26.